Such examination is not routine; had it not been carried out the condition would understandably have been labelled as anaplastic thyroid cancer with systemic metastatic disease. Hence histologic vigilance is needed in the diagnosis of anaplastic thyroid cancer.

In case 2 the patient presented with what appeared, both clinically and biochemically, to be subacute thyroiditis, a condition similar to that described by Shimaoka, VanHerle and Dindogru,[6] who encountered a similar situation in a patient with malignant lymphoma of the thyroid gland. Our case illustrates the value of fine-needle aspiration biopsy in the delineation of what was presumed to be a benign thyroid disease with a somewhat atypical course. The investigation of nodular disease of the thyroid gland, and in particular the suitability and safety of needle aspiration of the nodules for cytologic assessment, has been discussed in this journal.[1]

Since 7% of the population in North America are said to have thyroid nodules, there is ample opportunity for physicians to manage patients with goitre. While most goitres are benign, the particular cause — which could be primary or metastatic cancer — may not be easily discerned by clinical assessment. Patients presenting with nodular goitre deserve intelligent assessment and informed management, which even in the case of metastatic cancer in the thyroid gland can result in worthwhile palliation.

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Puerperal uterine inversion: report of nine cases

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Acute puerperal inversion of the uterus is considered to be rare. In one institution there were nine cases during an 11-year period, a rate of one for every 2176 vaginal deliveries. Analysis of these cases failed to identify any contributing factors occurring during the first or second stage of labour. Six cases were directly attributable to failure to administer an oxytocic preparation or, particularly, failure to await uterine contraction before attempting to expel the placenta by fundal pressure or cord traction. Although active management of the third stage of labour may reduce the incidence of postpartum hemorrhage, incomplete application of its principles is extremely hazardous. Immediate uterine replacement was efficacious in seven cases, but the inadvisability of removing the placenta prior to replacement was demonstrated.

On considère l'inversion utérine puerpérale aiguë comme rare. Dans une institution on en a compté neuf cas au cours d'une période de 11 ans, soit un taux de un cas par 2176 accouchements par voie vaginale. L'analyse de ces cas n'a permis d'identifier aucun facteur contributif ayant pu survenir au premier ou au second stade du travail. Six cas étaient directement attribuables à un manquement à administrer une préparation ocytocique et, particulièrement, à un manquement à attendre une contraction utérine avant d'entreprendre l'expulsion du placenta par pression sur le fundus ou par traction sur le cordon. Bien qu'un traitement actif du troisième stade du travail puisse réduire la fréquence des hémorragies puerpérales, l'application incomplète de ses principes peut être extrêmement risquée. La remise en place immédiate de l'utérus a été efficace dans sept cas, mais l'inopportunité de retirer le placenta avant de remettre l'utérus en place a été démontrée.

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The infrequent occurrence of acute puerperal inversion of the uterus has been attested to by all contemporary authors with the exception of Kitchin and colleagues,[1] who reported the alarming rate of one inversion per 2284 deliveries. Estimates of frequency have ranged between one per 17 000 deliveries and one per 200 000.[2] Das,[3] in a comparative study, reported rates ranging from one per 8537 deliveries in Indian hospitals to one per 23 127 in American and one per 27 000 in British hospitals.

In this paper we describe nine cases of puerperal uterine inversion that occurred at our institution during the 11-year period June 1966 to July 1977.

Patients

Using the computerized patient index, we examined the charts of all patients delivered during the 11-year period. Nine cases of puerperal uterine inversion had occurred in a total of 21 277 deliveries. During this period 1691 patients were delivered by cesarean section. The frequency of puerperal uterine inversion was therefore one per 2176 vaginal deliveries. For each case of puerperal uterine inversion the mother's age and parity, gestational age, mode of onset of labour, duration of the first stage of labour, duration of the second stage of labour, method of delivery and infant weight are shown in Table I.

Table I—Details of cases of puerperal uterine inversion

Case no.	Mother's age (yr); parity and gravidity	Gestational age (wk)	Mode of onset of labour	Duration of labour: First stage (h)	Duration of labour: Second stage (min)	Method of delivery	Infant weight (g)
1	20; 0 – 2	39	Spontaneous	3 3/4	16	Spontaneous	2730
2	25; 0 – 1	40	Spontaneous	7 3/4	29	Spontaneous	3100
3	25; 0 – 3	40	Spontaneous	7 1/4	71	Forceps	3260
4	32; 0 – 1	41	Spontaneous	6 3/4	28	Forceps	3060
5	31; 1 – 2	39	Spontaneous	5 3/4	21	Spontaneous	3190
6	28; 0 – 1	40	Spontaneous	8	63	Spontaneous	3390
7	25; 1 – 4	39	Spontaneous	4 1/4	4	Spontaneous	3450
8	17; 0 – 1	36	Induced	9	65	Forceps	3275
9	27; 1 – 2	40	Spontaneous	7 1/2	12	Spontaneous	3780

The patients' ages ranged from 17 to 32 years. Inversion occurred in six patients following delivery of their first viable infant; one of these patients had had one abortion and another had had two abortions. The inversion occurred in the other three patients following delivery of their second viable infant; one of the patients had previously completed an uncomplicated pregnancy, one had had two spontaneous abortions and one normal delivery, and the third had suffered a postpartum hemorrhage and a retained placenta with her first pregnancy.

Course of labour and management

Eight patients were delivered spontaneously at term; labour was induced in the ninth at what was thought to be 36 weeks' gestation because of moderately severe pre-eclampsia, but the infant's birthweight of 3275 g casts some doubt on the assessment of gestational age. The first stage of labour lasted between 3¾ and 9 hours. In one patient (case 8) the first-stage contractions were augmented by intravenous administration of oxytocin for the first 3 hours of labour. The second stage of labour lasted between 4 and 71 minutes. Spontaneous vertex deliveries were effected in six patients. In the remaining three patients low-forceps deliveries were performed. The infants' weights ranged from 2730 to 3780 g.

The duration and management of the third stage of labour are shown in Table II. In no instance did this stage exceed 25 minutes and no patients were given an oxytocic preparation prior to attempted delivery of the placenta. Fundal pressure accompanied maternal efforts in one case (no. 8). Cord traction was attempted in five cases and was sufficient to break the cord in two cases (nos. 5 and 9).

The further management of the inversion in each case is described below.

Case 1

A second-degree inversion was discovered 1½ hours after completion of the third stage of labour when the patient became hypotensive. Manual replacement of the uterus was carried out under general anesthesia. The uterine cavity was packed and synthetic oxytocin, 20 U/L, was infused. The patient required a transfusion of 8 units of blood. The puerperium was complicated by fever (temperature 39°C).

Case 2

A third-degree inversion was noted and the uterus was replaced manually under general anesthesia immediately after delivery of the placenta. Blood loss was estimated to be 1000 mL.

Cases 3, 4, 5, 7 and 8

In all instances the uterus was noted to be completely inverted when the placenta, still adherent to the uterine fundus, was delivered. The placenta was stripped from the fundus prior to manual replacement of the uterus without anesthesia. Synthetic oxytocin, 20 U/L, was infused after replacement. Transfusions of 2 and 3 units of blood were administered in cases 3 and 5 respectively. None of the patients had a blood loss in excess of 1 L.

Case 6

A third-degree inversion was noted immediately after delivery of the placenta. The uterus was immediately replaced manually under general anesthesia. No oxytocic preparation was administered. Two hours later the patient was noted to be in shock and vaginal examination revealed a second-degree inversion. Attempts at manual replacement under anesthesia failed. Laparotomy was performed and uterine replacement achieved by traction on the round ligaments. Synthetic oxytocin, 40 U/L, was infused postoperatively. The patient required 8 units of whole blood.

Case 9

When the placenta, still adherent to the uterine fundus, was delivered, the uterus was seen to be completely inverted. The placenta was peeled off, following which attempts at manual replacement failed. During this time the patient lost an estimated 2.5 L of blood. Laparotomy was performed and total abdominal hysterectomy carried out. The patient required 9 units of whole blood.

In eight of the nine patients a

Table II—Duration and management of the third stage of labour

Case no.	Duration of third stage (min)	Oxytocic given before delivery of placenta	Fundal pressure	Cord traction
1	20	No	No	No
2	7	No	No	No
3	12	No	No	No
4	6	No	No	Yes
5	20	No	No	Yes
6	8	No	No	Yes
7	20	No	No	Yes
8	23	No	Yes	No
9	20	No	No	Yes

third-degree inversion was immediately recognized. The one initial second-degree inversion was discovered 1½ hours after completion of the third stage of labour. One patient sustained a second-degree inversion after a third-degree inversion was corrected. Inversion occurred with the placenta still adherent in six patients, and in all six the placenta was removed prior to replacement of the uterus. Only one of these six had profuse bleeding after the procedure. Two patients were treated by laparotomy, one requiring abdominal hysterectomy. All patients were discharged in good health. We have been unable to discover any reports on subsequent obstetric performance in these patients.

Discussion

In several series of cases and literature reviews no obvious cause has been found to account for 40% of cases of acute puerperal inversion; hence in these cases the condition has been referred to as spontaneous.[3-5] There has been remarkable consistency in the reported frequency of spontaneous inversion, and the figure of 40% was approximated in our series, though the small number of cases makes expression by percentages statistically meaningless. What is of greater importance is the occurrence of six cases that can be directly attributed to improper management of the third stage of labour.

Undoubtedly active management of the third stage of labour has decreased the frequency of postpartum hemorrhage without increasing the occurrence of retention of the placenta. Among 10 082 pregnancies in which active management of the third stage was instituted, the proportion with postpartum hemorrhage was less than 2%, as compared with 5% in 33 149 pregnancies not managed actively.[6] The rate of placental retention was not significantly different in the two groups, and no uterine inversions were reported in the first group.

The critical aspect of Fliegner and Hibbard's[6] management was the administration of an oxytocic preparation at the end of the second stage. In addition, it was mandatory that the uterus be contracted prior to any attempt to deliver the placenta. Neither condition was fulfilled in any patient of our series. Only one patient received oxytocin prior to the second stage of labour, and in that instance the infusion was discontinued 6 hours before delivery. No patient was given an oxytocic preparation between the second stage of labour and the attempt to deliver the placenta. This must cast doubt on the assertion by Kitchin and colleagues[1] that the misuse of oxytocics is an important factor in the production of acute puerperal inversion.

Seven patients in our series were treated by immediate manual replacement of the inverted uterus. Only two required general anesthesia and in five replacement was carried out manually without anesthesia. Inversion recurred in one patient, to whom postpartum oxytocin therapy was not given. It appears, therefore, that maintenance of the uterine position depends on adequate uterine contractions. Despite the fact that the inversion was not recognized for 1½ hours, manual replacement under general anesthesia proved possible in one patient, who had a second-degree inversion; whether replacement would have been possible had the inversion been more pronounced is debatable. Reid[7] has stressed the difficulty in replacing the uterus in cases of subacute inversion, a point well illustrated by our case 6, in which the recurrent inversion was second-degree and remained unrecognized for a similar period, then required operative replacement. No attempts were made to replace the uterus by the hydrostatic method of O'Sullivan[8] in the two patients who underwent abdominal operations. Had this method been used before the placenta was stripped from the uterine fundus patient 9 might have been spared both the severe blood loss and the necessity for abdominal operation.

The importance of leaving the placenta attached prior to replacement is well documented.[2,4,9] It is surprising that severe blood loss occurred in only one of six patients in whom the placenta was removed with the uterus inverted.

Conclusions

From our study of nine cases of puerperal uterine inversion we doubt whether oxytocin is a causative agent in this condition. Both physiologic and active forms of management of the third stage of labour are acceptable, although routine active management will diminish the frequency of postpartum hemorrhage. However, when the principles of active management — administration of an oxytocic preparation with crowning of the head or with delivery of the anterior shoulder, followed by controlled cord traction only when the uterus is firmly contracted — are abused the risks of puerperal uterine inversion are substantial. Meticulous attention must be paid to the state of uterine contraction prior to any attempt to deliver the placenta. Removal of the placenta prior to uterine replacement may be accompanied by profuse bleeding and is strenuously to be discouraged.

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